

ABSTRACT

A furnace incorporating a novel thermal design is disclosed. Heating element temperature is reduced compared to conventional designs while providing a precisely controllable process temperature in the range 1000 - 1400 degrees centigrade. A plurality of Kanthal heating elements are arranged in a planar array as close to the work as possible, thus approximating an isothermal condition with respect to the work. The process chamber is made of aluminum and its internal surfaces are highly polished to reflect heat. The chamber walls have built in active cooling to carry away non-reflected heat and preserve high reflectivity. The heating elements are modular to facilitate removal and replacement without disassembly of the furnace. The configuration of the heating elements is linear rather than coiled and the temperature is monitored directly by measuring the electrical resistance of the Kanthal wires.